**Transcript for NPR broadcast: Did Climate Change drive Human Evolution?**

There's a plan afoot among evolutionary scientists to launch a big new project — to look back in time and find out how climate change over millions of years affected human evolution.

A panel of experts from the National Academy of Sciences in Washington, D.C., has given its blessing to the plan. They say it could unveil a whole new side of human history.

Anthropologist Rick Potts, who heads the human origins department at the Smithsonian Museum of Natural History, has been pushing the idea that "climate made us" for years.

Lately, he's been putting together an exhibit called "What Does It Mean to Be Human?" Among cabinets displaying dozens of skulls of human ancestors, and bronze statues of Neanderthals and other evolutionary experiments, there are displays suggesting the novel idea that climate change influenced how we evolved.

"The explanations that we've had tied human origins back to an African savannah or to a European ice age," Potts says, "and it was never really adequate to understand the plasticity, the versatility of the human species."

**Habitats Kept Changing, And So Did The Humans**

Darwin's idea was that living things adapt to a place — a habitat.

[Enlarge imagei](http://www.npr.org/templates/story/story.php?storyId=124906102)

Skeletons currently on display at the National Museum of Natural History: (left to right) *Homo erectus*, 1 million years old; *Australopithecus afarensis*, 2.5 million years old; *Homo neanderthalensis*, 32,000 to 100,000 years old. Researchers are using ancient remains like these to learn more about the effects climate change may have had on evolution.

Chip Clark/Smithsonian Institution



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But Potts says habitats kept changing because climates kept changing. Centuries of drought, for example, would shift to centuries of monsoons, over and over. Which raises a question, Potts says: "Not how did humans become adapted to a specific ancestral environment, but how did we become adaptable?" Extraordinarily adaptable to so many different environments.

"And that's a totally new question," he says, "one that Darwin never really addressed."

Potts is one of the authors of the National Academy of Sciences report, and proposes that it was flip-flopping climate that sparked some of our biggest evolutionary adaptations — the invention of better tools, for example, or a bigger brain.

To find out, the science academy developed a plan: get a fuller climate history in places where human ancestors lived — like East Africa. And you can do that by digging into sediments at the bottom of African lakes.

**Lake Sediment Has The Clues To Climate History**

**Web Resource**

[Find Out More About Human Evolution At The National Museum Of Natural History](http://humanorigins.si.edu/)

"You can think of it almost like the rings of a tree," says Andrew Cohen at the University of Arizona. He drills into lake bottoms and retrieves tubes of muck. Lake sediments are stacked in those cores like pages in a book. They contain clues to millions of years of climate history, Cohen says — "everything from the fossils of the plant pollen and the organisms that lived in the lakes that respond to climate, to the chemistry of the sediments that also can give us very detailed information about changes in temperature and precipitation."

Scientists can compare these climate timelines to the fossil record of our ancestors to see how climate change affected evolution, but they'll need more bones to do that. Potts says images from satellites or airborne drones could pinpoint where to find them.

"The idea of being able to target in on places — hmmm, here's a white spot in Africa that is a place in the satellite image where there is exposure, it's not vegetated, let's go there and let's have a look," he says.

The scientists will also want to look at how climate change affected the animals we evolved with.

Take the case of the Pleistocene extinctions — the extermination of big mammals like mammoths and saber-toothed cats during the last ice age. One popular theory is that rapacious human hunters did them in.

**Better Off Than The Musk Oxen**

But Tom Gilbert, a geneticist at the University of Copenhagen, says maybe not. Gilbert got DNA from 149 musk oxen — some from as far back as 57,000 years. The musk ox is a big, hairy animal that lived through the Pleistocene extinctions, but just barely.

By studying musk ox DNA, Gilbert could tell where and when their populations waxed and waned. He then looked at where human hunters were.

"We have musk ox in Greenland. When did humans get to Greenland?" says Gilbert. "We have musk ox in Canada, when did humans get to Canada?"

The record shows that when man and musk ox met, the herds did not suffer that much. What did kill them off was rapid climate change.

"It does seem with the musk ox, there is this overall matching trend that when the climate is really oscillating up and down, the musk ox seem to be doing very badly, their populations seem to be declining," Gilbert says.

So, apparently musk oxen didn't manage climate change so well, and humans have. At least that's the hypothesis that scientists want to test: that repeated climate change made us — those of us it didn't kill first — more adaptable that just about any other creature on the planet.

<http://www.npr.org/templates/story/story.php?storyId=124906102>